

(19)



Europäisches Patentamt  
European Patent Office  
Office européen des brevets



(11)

**EP 0 832 609 A3**

(12)

**EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:  
16.06.1999 Bulletin 1999/24

(51) Int Cl.<sup>6</sup>: **A61B 17/34, A61B 19/00,  
A61B 10/00**

(43) Date of publication A2:  
01.04.1998 Bulletin 1998/14

(21) Application number: **97307554.2**

(22) Date of filing: **26.09.1997**

(84) Designated Contracting States:  
**AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC  
NL PT SE**  
Designated Extension States:  
**AL LT LV RO SI**

- **Wood, Christopher H., 970 S.W. Eleventh Place  
State of Washington, 98045 (US)**
- **Dayton, Patrick A.  
(US)**

(30) Priority: **30.09.1996 US 27402 P**

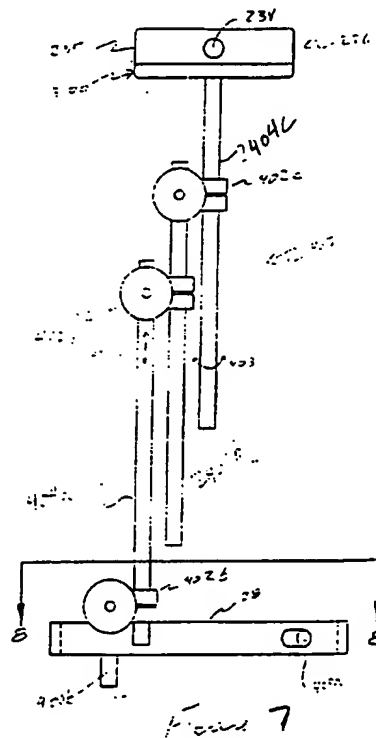
(71) Applicant: **PICKER INTERNATIONAL, INC.  
Cleveland, Ohio 44143 (US)**

(74) Representative: **Waters, Jeffrey  
The General Electric Company, p.l.c.  
GEC Patent Department  
Waterhouse Lane  
Chelmsford, Essex CM1 2QX (GB)**

(72) Inventors:  
• **Barnett, Gene H.  
Shaker Heights, Ohio (US)**

**(54) Position tracking**

(57) A position signaling is usable in connection with an image guided surgery system. A plurality of infrared emitters (228a-d) are mounted on a reference object (226). The reference object is in turn attached to the rocker arm (28) of a head clamp (12). The head clamp includes a frame and a first head engaging pin secured to one side of the frame. The rocker arm includes two head engaging pins (30,32) and is movable in relation to the frame. The image guided surgery system uses the signals provided by the infrared emitters to determine and account for movement of the patient's head.



**BEST AVAILABLE COPY**

**EP 0 832 609 A3**

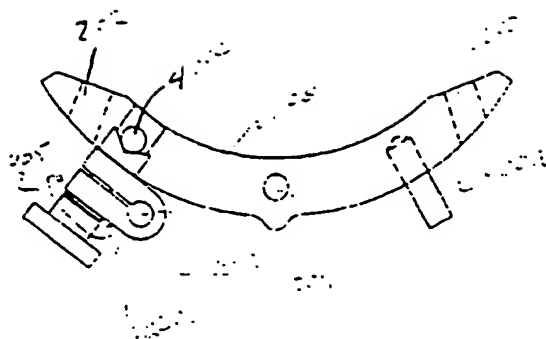


FIG 8



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 97 30 7554

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	WO 94 24933 A (UNIV ST LOUIS) 10 November 1994 * page 16, line 30 - page 17, line 6; figure 4A *	1,3,13, 19,21	A61B17/34 A61B19/00 A61B10/00
X	WO 96 10368 A (NOMOS CORP) 11 April 1996  * page 6, line 20 - line 32 * * page 7, line 23 - page 8, line 7; figure 3 *	1-5,9, 10,14, 15,17, 19,20, 22,24, 26,27,30	
P,X	DE 297 07 917 U (AESCULAP AG & CO KG) 3 July 1997 * page 7, line 28 - page 8, line 5 * * page 13, line 23 - line 28; figure 1 *	1-4,12, 14,19,20	
A	US 5 617 857 A (FAUL IVAN ET AL) 8 April 1997 * column 5, line 33 - line 47; figure 1 *	1,13,14, 19,24	TECHNICAL FIELDS SEARCHED (Int.Cl.6) A61B
A,D	US 5 517 990 A (KALFAS IAIN H ET AL) 21 May 1996 * abstract; figure 1 *		
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 19 April 1999	Examiner Mayer, E
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons &amp; : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03 92 (P4C01)

ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.

EP 97 30 7554

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

19-04-1999

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9424933 A	10-11-1994	AU 6818694 A	21-11-1994
		CA 2161430 A	10-11-1994
		DE 9422172 U	06-08-1998
		EP 0699050 A	06-03-1996
		US 5871445 A	16-02-1999
WO 9610368 A	11-04-1996	US 5695501 A	09-12-1997
		AU 3760895 A	26-04-1996
		BR 9509214 A	28-10-1997
		EP 0783279 A	16-07-1997
DE 29707917 U	03-07-1997	NONE	
US 5617857 A	08-04-1997	NONE	
US 5517990 A	21-05-1996	US 5309913 A	10-05-1994
		EP 0676178 A	11-10-1995
		JP 8052115 A	27-02-1996
		US 5776064 A	07-07-1998
		US 5732703 A	31-03-1998
		DE 69318944 D	09-07-1998
		DE 69318944 T	01-10-1998
		EP 0600610 A	08-06-1994
		JP 7148180 A	13-06-1995

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82